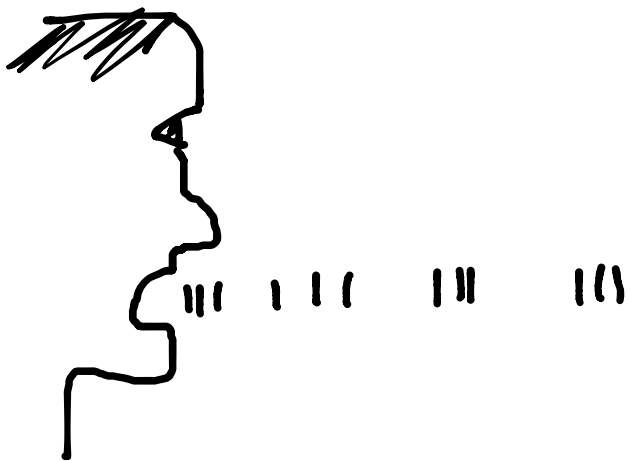


Sound Notes

Sound - longitudinal wave
created by a vibrating surface



- Sound propagates due to
elastic collisions of air molecules

Sound travels differently through
different media:

Vacuum	Sound doesn't travel
Air	$v_s = 331 + 0.6T$ (Temp in $^{\circ}\text{C}$.)
Water	at STP $v = 1498 \text{ m/s}$
Solid	$1200 \text{ m/s} - 5200 \text{ m/s}$

↑
steel or granite
- speed of sound depends
on density and elasticity.

The frequency of a sound
wave is commonly called
pitch.

Humans can hear 20Hz -
20,000Hz

the exact range is dependent
on the size + elasticity of
a person's eardrum.

The amplitude of a sound wave
determines its volume.

We measure volume in decibels.

dB scale is logarithmic every
10 dB is 10 times louder.

0 dB	Theoretical Lower Limit for humans
2 dB	Blood move through you
20 dB	whisper

0dB conversation

80dB long term hearing loss

90dB scream

110dB Rock concert / Jet engine

120dB Threshold of Pain

130dB Gunshot

140dB immediate hearing loss

A scream is 10,000,000
times louder than a whisper.

Light Notes

Light - transverse waves
created by moving charges.

- When a charge vibrates,
that causes a ripple in the
E-field, which causes a
changing B-field, which causes
a

- visible light is created when electrons move between energy levels.

Speed of light

Vacuum $c = 3 \times 10^8 \text{ m/s}$

Air $0.999c$

Water $0.67c$

Solids $0.5c$

